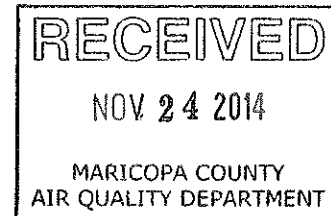




**Palo Verde
Nuclear Generating Station**
P.O. Box 52034
Phoenix, AZ 85072
Mail Station 7626
Tel 623 393 6688

ID#: 291-04818-MPE/PD
November 19, 2014

Mr. Todd Martin
Non-Title V Unit Manager
Maricopa County Air Quality Department
1001 N. Central Ave.
Phoenix, AZ 85004



Dear Mr. Martin:

**Subject: NOTIFICATION OF MINOR MODIFICATION TO ADD EMERGENCY
DIESEL GENERATORS - PERMIT #030132**

This Notification of Minor Modification is to provide application to Maricopa County Air Quality Department for Palo Verde Nuclear Generating Station (PVNGS) to add additional emergency diesel driven equipment.

We are proposing to add new towable generators to be permitted as stationary. The new equipment is two Cummins model DQKAE 2000 kilowatt generators rated at 2922 bhp.

Enclosed is the permit application form, supporting documentation and a check for the \$200 filing fee. This change is being made in accordance with the requirements of Maricopa County Rule 220 § 405 and Maricopa County Rule 280 § 302.1.a.

If you have any questions please call Mr. Paul DiCiccio at (623) 393-6657, or (480) 789-1284.

Based on information and belief formed after reasonable inquiry, the statements and information in the Notification of Minor Modification and permit application update are true, accurate, and complete.

Sincerely,

Martin P. Eroh
Department Leader, Environmental

MPE/PD/hsc

Enclosures



Maricopa County

Air Quality Department

Deliver or Mail all Applications to:

MCAQD

Permit Application Intake

1001 N Central Avenue, Suite 125

Phoenix AZ 85004

Air Quality Department Offices

Phone: (602) 506-6010

Web Site: <http://www.maricopa.gov/aq/>

NOTIFICATION OF MINOR MODIFICATION AT A CURRENTLY PERMITTED FACILITY

Per Rule 220, Section 405 and Section 406, this notification must be submitted for a currently permitted facility for a minor permit revision. This notification is not required for changes in work schedules or relocation of equipment for similar use within a permitted facility.

Submit this notification prior to making the modifications. If confidentiality is claimed pursuant to ARS §49-487, a fully completed application with confidential information clearly identified along with a separate copy of the application for public review without the confidential information and a written justification for the confidentiality claimed must be submitted. Complete both sides by typing or printing legibly. A filing fee of **\$200.00** must accompany your application (make checks payable to MCAQD). If the application is submitted as a result of receiving a notice of violation (NOV), an additional **\$100.00** late fee must accompany the application. Before the permit is issued, the Permittee will be billed for all permit processing time required for a billable permit action at a rate of \$145.00 per hour, adjusted annually under Department Rule 280 (Fees), §304. An annual administrative fee will also be charged per Rule 280, §302.2. For questions regarding billing, call (602) 372-1071.

BUSINESS NAME: Palo Verde Nuclear Generating Station		EXISTING AIR QUALITY PERMIT NUMBER FOR THIS SITE: 030132 App ID 405449	
ADDRESS OF SITE: 5801 S. Wintersburg Rd.			
CITY: Tonopah	STATE: AZ	ZIP CODE: 85354	TELEPHONE AT SITE: (623) 393-6657
CONTACT PERSON: Paul DiCiccio			
MAILING ADDRESS: PO Box 52034			
CITY: Phoenix	STATE: AZ	ZIP CODE: 85072- 2034	TELEPHONE: (623) 393-6657
FAX: (623) 393-5442		E-MAIL: Paul.Diciccio@aps.com	

BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THIS DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE

DATE 11/19/14 SIGNATURE OF OWNER OR
RESPONSIBLE OFFICIAL OF BUSINESS 

TYPE OR PRINT NAME AND TITLE Brad Berryman – VP Site Operations – General Plant Manager

DO NOT WRITE IN THIS SPACE.

REVIEWED BY _____ DATE _____

☐ APPROVED

☐ DENIED

REASON FOR
DENIAL: _____

1. NARRATIVE DESCRIPTION OF THE PROPOSED MODIFICATION: Due to additional readiness requirements from the Nuclear Regulatory Commission (NRC), the Palo Verde Nuclear Generating Station will be purchasing supplementary emergency generating power
This new equipment will be placed in a building designed to hold this equipment, and will only be operated for maintenance
testing purposes, periods of emergency, and to prevent occurrences of unsafe conditions during electrical system maintenance.
Each engine is expected to run approximately three hours per year.

2. PROVIDE A LIST OF EQUIPMENT AND EMISSION CONTROL DEVICES WHICH WILL BE INSTALLED OR MODIFIED:

ASSIGNED EQUIPMENT NUMBER	DESCRIBE EACH PIECE OF EQUIPMENT INCLUDE MAKE & MODEL	DATE OF INSTALLATION OR MODIFICATION	HOW MANY	HP, KVA GALLONS OR OTHER RATING (Specify Units)	EXHAUST	
					VENT TO AIR	VENT TO CONTROL (Identify)
AEBDNG05A AEBDNG05B	Cummins 2000 kW DQKAE GenSet	Nov 2014	2	2922	X	

3. MATERIALS LIST: List all materials handled, stored, processed, used, mixed, treated, or emitted. Include chemicals, mixtures, resins, cleaning compounds, etc., in this list. Identify each material in sufficient detail and provide material safety data sheets (MSDS).

MATERIAL	ANNUAL USAGE OR THROUGHPUT	CHEMICAL COMPOSITION (% by weight)	EQUIPMENT NUMBER IN WHICH USED
#2 Diesel	850 gallons	100%	AEBDNG05A AEBDNG05B

4. DESCRIBE CONTROL DEVICES

TYPE OF DEVICE	NAME / ID	GAS FLOW RATE SCFM	LIQUID FLOW RATE GAL/MIN	CONTROL EFFICIENCY (% WEIGHT)

5. MATERIALS RECLAIMED OR SHIPPED AS WASTE:

IF APPLICABLE, COMPLETE THE ATTACHED SECTION Z-M.

SECTION Z-M. AIR POLLUTANT EMISSIONS

PROVIDE A SUMMARY OF THE PROJECTED ACTUAL AIR EMISSIONS ON AN ANNUAL BASIS FOR THE ENTIRE SITE IN THE FOLLOWING SUMMARY TABLES. ATTACH DETAILED CALCULATIONS TO SUPPORT THE FIGURES. **IF SUPPORTING CALCULATIONS ARE NOT INCLUDED WITH THE APPLICATION, THE APPLICATION WILL BE DEEMED INCOMPLETE.**

PROVIDE A SUMMARY OF THE ACTUAL AIR EMISSIONS ON AN ANNUAL BASIS FOR THE FOLLOWING THREE COLUMNS:

- (i) EMISSIONS TO BE RELEASED FROM ONLY THE EQUIPMENT AND AFFECTED PROCESSES DESCRIBED ON THIS NOTIFICATION
- (ii) THE ENTIRE SITE PRIOR TO THE MODIFICATION OF THE EQUIPMENT AND PROCESSES DESCRIBED IN (i) ABOVE.
- (iii) THE ENTIRE SITE INCLUDING THE EMISSIONS IDENTIFIED IN (i) ABOVE. NORMALLY, THIS COLUMN WILL BE THE SUM OF COLUMNS (i) AND (ii).

POLLUTANT	ACTUAL EMISSIONS OR PROJECTED ACTUAL EMISSIONS IN POUNDS PER YEAR		
	COLUMN (i)	COLUMN (ii)	COLUMN (iii)
CARBON MONOXIDE (CO)	7	24,773	24,780
OXIDES OF NITROGEN (NO _x)	205	94,338	94,543
OXIDES OF SULFUR (SO _x)	0.2	48	48
PARTICULATES OF 10 MICRONS OR SMALLER (PM ₁₀)	1.5	55,243	55,245
TOTAL SUSPENDED PARTICULATES (TSP), INCLUDING PM ₁₀	N/A	N/A	N/A
VOLATILE ORGANIC COMPOUNDS (VOCs) ¹	4	19,980	19,980
FEDERAL HAZARDOUS AIR POLLUTANTS (LIST EACH ONE SEPARATELY):			
Note: Values in column ii are taken from the 2013 AEI and emissions from additional equipment added during 2014.			

¹ VOCs are defined by EPA at: http://www.epa.gov/ttn/naaqs/ozone/ozonetech/def_voc.htm

Attach detailed calculations to support the figures in the above summary tables. Do not include the emissions from motor vehicles. Include the emissions from stationary sources, portable sources, test areas, experimental facilities, evaporative losses, storage and handling losses, fuel loading and unloading losses, etc. Specifically identify the following in detailed calculations:

- | | |
|--|-------------------------------|
| 1. EMISSIONS FROM EACH POINT SOURCE AND EACH STACK | 4. OVERALL EFFICIENCIES |
| 2. CAPTURE EFFICIENCIES | 5. FUGITIVE EMISSIONS |
| 3. CONTROL EFFICIENCIES | 6. NON-POINT (AREA) EMISSIONS |

For particulate (dust) emissions, describe the types of particulates being emitted and the quantities of emissions for each type. Identify and quantify each and every type of VOC that is included in the above summary tables. Whenever a material is identified by a trade name, also provide its generic name and its chemical abstract service (CAS) number.

Help sheets for calculating emissions from specific industries or processes can be obtained at:
http://www.maricopa.gov/ag/divisions/planning_analysis/emissions_inventory/instructions.aspx

If you need help completing the application package, please see our website or contact 602-506-5102.
<http://www.maricopa.gov/ag/>

FEDERAL HAZARDOUS AIR POLLUTANTS LIST

(Federal Clean Air Act, Title I, Section 112(b))

CAS No.	Chemical name	CAS No.	Chemical name	CAS No.	Chemical name
75077	Acetaldehyde	121697	N,N-Diethyl aniline (N,N-Dimethylaniline)	101688	Methylene diphenyl diisocyanate (MDI)
60355	Acetamide	64675	Diethyl sulfate	101779	4,4'-Methylenedianiline
75058	Acetonitrile	119904	3,3-Dimethoxybenzidine	91203	Naphthalene
98862	Acetophenone	60117	Dimethyl aminoazobenzene	98953	Nitrobenzene
53963	2-Acetylaminofluorene	119937	3,3'-Dimethyl benzidine	92933	4-Nitrobiphenyl
107028	Acrolein	79447	Dimethyl carbamoyl chloride	100027	4-Nitrophenol
79061	Acrylamide	68122	Dimethyl formamide	79469	2-Nitropropane
79107	Acrylic acid	57147	1,1-Dimethyl hydrazine	684935	N-Nitroso-N-methylurea
107131	Acrylonitrile	131113	Dimethyl phthalate	62759	N-Nitrosodimethylamine
107051	Allyl chloride	77781	Dimethyl sulfate	59892	N-Nitrosomorpholine
92671	4-Aminobiphenyl	534521	4,6-Dinitro-o-cresol, and salts	58382	Parathion
62533	Aniline	51285	2,4-Dinitrophenol	82688	Pentachloronitrobenzene (Quintobenzene)
90040	o-Anisidine	121142	2,4-Dinitrotoluene	87865	Pentachlorophenol
1332214	Asbestos	123911	1,4-Dioxane (1,4-Diethyleneoxide)	108952	Phenol
71432	Benzene (including benzene from gasoline)	122667	1,2-Diphenylhydrazine	108503	p-Phenylenediamine
92875	Benzidine	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	75445	Phosgene
98077	Benzotrithionide	106887	1,2-Epoxybutane	7803512	Phosphine
100447	Benzyl chloride	140885	Ethyl acrylate	7723140	Phosphorus
92524	Biphenyl	100414	Ethyl benzene	85449	Phthalic anhydride
117817	Bis(2-ethylhexyl)phthalate (DEHP)	51796	Ethyl carbamate (Urethane)	1336363	Polychlorinated biphenyls (Aroclors)
542881	Bis(chloromethyl)ether	75003	Ethyl chloride (Chloroethane)	1120714	1,3-Propane sulfone
75252	Bromoform	106934	Ethylene dibromide (Dibromoethane)	57578	beta-Propiolactone
106990	1,3-Butadiene	107062	Ethylene dichloride (1,2-Dichloroethane)	123386	Propionaldehyde
156627	Calcium cyanamide	107211	Ethylene glycol	114261	Propoxur (Baygon)
133062	Captan	151564	Ethyleneimine (Aziridine)	78875	Propylene dichloride (1,2-Dichloropropane)
63252	Carbaryl	75218	Ethylene oxide	75569	Propylene oxide
75150	Carbon disulfide	96457	Ethylene thiourea	75558	1,2-Propylenimine(2-Methyl aziridine)
56235	Carbon tetrachloride	75343	Ethylene thiolurea	91225	Quinoline
463581	Carbonyl sulfide	50000	Formaldehyde	106514	Quinone
120809	Catechol	76448	Heptachlor	100425	Styrene
33904	Chloramben	118741	Hexachlorobenzene	98093	Styrene oxide
57749	Chlordane	87683	Hexachlorobutadiene	1748016	2,3,7,8-Tetrachlorodibenzo-p-dioxin
7782505	Chlorine	77474	Hexachlorocyclopentadiene	79345	1,1,2,2-Tetrachloroethane
79118	Chloroacetic acid	67721	Hexachloroethane	127184	Tetrachloroethylene (Perchloroethylene)
532274	2-Chloroacetophenone	822060	Hexamethylene-1,6-diisocyanate	7550450	Titanium tetrachloride
108907	Chlorobenzene	680319	Hexamethylphosphoramide	108883	Toluene
510156	Chlorobenzilate	110543	Hexane	98807	2,4-Toluene diamine
67663	Chloroform	302012	Hydrazine	584849	2,4-Toluene diisocyanate
107302	Chloromethyl methyl ether	7647010	Hydrochloric acid	95534	o-Toluidine
128998	Chloroprene	7664393	Hydrogen fluoride (Hydrofluoric acid)	8001352	Toxaphene (chlorinated camphene)
1319773	Cresols/Cresylic acid (isomers and mixture)	123319	Hydroquinone	120821	1,2,4-Trichlorobenzene
95487	o-Cresol	78591	Isophorone	79005	1,1,2-Trichloroethane
108394	m-Cresol	56899	Lindane (all isomers)	79016	Trichloroethylene
106445	p-Cresol	108316	Maleic anhydride	95954	2,4,5-Trichlorophenol
98828	Cumene	67561	Methanol	88062	2,4,6-Trichlorophenol
94757	2,4-D, salts and esters	72435	Methoxychlor	121448	Triethylamine
3547044	DDE	74839	Methyl bromide (Bromomethane)	1582098	Trifluorin
334883	Diazomethane	74873	Methyl chloride (Chloromethane)	540841	2,2,4-Trimethylpentane
132649	Dibenzofurans	71556	Methyl chloroform (1,1,1-Trichloroethane)	108054	Vinyl acetate
96128	1,2-Dibromo-3-chloropropane	60344	Methyl hydrazine	593602	Vinyl bromide
84742	Dibutylphthalate	74894	Methyl iodide (Iodomethane)	75014	Vinyl chloride
106467	1,4-Dichlorobenzene(p)	108101	Methyl isobutyl ketone (Hexone)	75354	Vinylidene chloride (1,1-Dichloroethylene)
91941	3,3-Dichlorobenzidene	634839	Methyl isocyanate	1330207	Xylenes (isomers and mixture)
111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)	80626	Methyl methacrylate	95476	o-Xylenes
542756	1,3-Dichloropropene	1634044	Methyl tert butyl ether	108383	m-Xylenes
62737	Dichlorvos	101144	4,4-Methylene bis(2-chloroaniline)	106423	p-Xylenes
111422	Diethanolamine	75092	Methylene chloride (Dichloromethane)		

For all listings above which contain the word "compounds" and for glycol ethers, unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical as part of that chemical's infrastructure.

[1] X-CN where X = H⁺ or any other group where a formal dissociation may occur. For example KCN or Ca(CN)₂.

[2] Includes mono- and di- ethers of ethylene glycol, diethylene glycol and triethylene glycol R(OCH₂CH₂)_n-OR' where:

n = 1, 2 or 3

R = alkyl C7 or less, or phenyl or alkyl substituted phenyl

R' = H, or alkyl C7 or less, or carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate.

[3] Includes mineral fiber emissions from facilities manufacturing or processing glass, rock or slag fibers or other mineral derived fibers of average diameter one (1) micrometer or less.

[4] Includes organic compounds with more than one (1) benzene ring and which have a boiling point greater than or equal to 100°C.

[5] A type of atom which spontaneously undergoes radioactive decay

Cummins 2000 kW DQKAE

Emissions Calculations

2922 bph – 141.4 gal/hr

CO

0.18 g/hp-hr X 2922 hp X 3 hr/yr X 1 lb/454 g X 2 GenSets = 7 lbs CO/yr

NO_x

5.3 g/hp-hr X 2922 hp X 3 hr/yr X 1 lb/454 g X 2 GenSets = 205 lbs NO_x/yr

SO_x

0.213 lbs/ 1000gal X 141.4 gal/hr X 3 hr/yr X 2 GenSets = 0.2 lbs SO_x/yr

PM

0.04 g/hp-hr X 2922 hp X 3 hr/yr X 1 lb/454 g X 2 GenSets = 1.5 lbs PM/yr

VOC

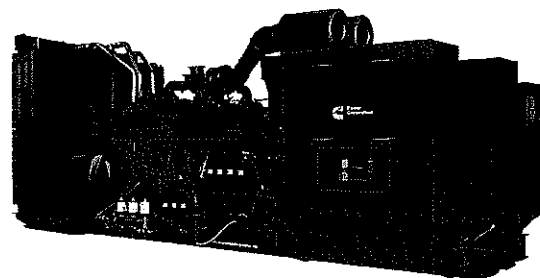
0.11 g/hp-hr X 2922 hp X 3 hr/yr X 1 lb/454 g X 2 GenSets = 4 lbs VOC/yr

Specification sheet



Diesel generator set QSK60 series engine

1450 kW - 2250 kW 60 Hz



Description

Cummins Power Generation commercial generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for stationary standby and prime power applications.

Features

Cummins® heavy-duty engine - Rugged 4-cycle, industrial diesel delivers reliable power, low emissions and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

Permanent magnet generator (PMG) - Offers enhanced motor starting and fault clearing short-circuit capability.

Control system - The PowerCommand® digital control is standard equipment and provides total genset system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protective relay, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

Cooling system - Standard and enhanced integral set-mounted radiator systems, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat.

NFPA - The genset accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

Warranty and service - Backed by a comprehensive warranty and worldwide distributor network.

Model	Standby rating	Prime rating	Continuous rating	Emissions compliance	Data sheets
	60 Hz kW (kVA)	60 Hz kW (kVA)	60 Hz kW (kVA)	EPA	60 Hz
DQKAD	1750 (2187)	1600 (2000)	1450 (1812)	EPA	D-3509
DQKAE	2000 (2500)	1825 (2281)	1600 (2000)	EPA Tier 2	D-3510
DQKAF	2250 (2812)	1825 (2281)		EPA Tier 2	D-3511

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cumminspower.com

Generator set specifications

Governor regulation class	ISO8528 Part 1 Class G3
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
Radio frequency emissions compliance	IEC 801.2 through IEC 801.5; MIL STD 461C, Part 9

Engine specifications

Bore	158.8 mm (6.25 in)
Stroke	190 mm (7.48 in)
Displacement	60.2 litres (3673 in ³)
Configuration	Cast iron, V 16 cylinder
Battery capacity	2200 amps minimum at ambient temperature of 0 °C (32 °F)
Battery charging alternator	55 amps
Starting voltage	24 volt, negative ground
Fuel system	Cummins' Modular Common Rail System
Fuel filter	Two stage spin-on fuel filter and water separator system. Stage 1 has a three element, 7 micron filter and Stage 2 has a three element, 3 micron filter.
Air cleaner type	Dry replaceable element
Lube oil filter type(s)	Four spin-on, combination full flow filter and bypass filters
Standard cooling system	High ambient cooling system

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	2/3 pitch
Rotor	Single bearing, flexible disc
Insulation system	Class H on low and medium voltage, Class F on high voltage
Standard temperature rise	125 °C standby / 105 °C prime
Exciter type	PMG (permanent magnet generator)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform total harmonic distortion	< 5% no load to full linear load, < 3% for any single harmonic
Telephone influence factor (TIF)	< 50 per NEMA MG1-22.43
Telephone harmonic factor (THF)	< 3

Available voltages

60 Hz line-neutral/line-line

• 220/380	• 240/416	• 255/440	• 7200/12470
• 277/480	• 347/600	• 2400/4160	• 7620/13200
			• 7970/13800

Note: Consult factory for other voltages.

Generator set options and accessories

Engine

- ☐ 208/240/480 V thermostatically controlled coolant heater for ambient above and below 4.5 °C(40 °F)
- ☐ Dual 120/208/240/480 V 300 W lube oil heaters
- ☐ Heavy duty air cleaner
- ☐ Triplex fuel filter

Alternator

- ☐ 80 °C rise
- ☐ 105 °C rise
- ☐ 125 °C rise
- ☐ 150 °C rise
- ☐ 120/240 V 300 W anti-condensation heater
- ☐ Increased motor starting capabilities

Control panel

- ☐ PowerCommand 3.3
- ☐ Multiple language support
- ☐ 120/240 V 100 W control anti-condensation heater
- ☐ Exhaust pyrometer
- ☐ Ground fault indication
- ☐ Remote annunciator panel
- ☐ Paralleling relay package
- ☐ Shutdown alarm relay package
- ☐ Audible engine shutdown alarm
- ☐ AC output analog meters (bargraph)

Exhaust system

- ☐ Industrial grade exhaust silencer
- ☐ Residential grade exhaust silencer
- ☐ Critical grade exhaust silencer
- ☐ Exhaust packages

Cooling system

- ☐ Remote cooling
- ☐ Enhanced high ambient temperature (50 °C)

Generator set

- ☐ Battery
- ☐ Battery charger
- ☐ Bottom entry chute
- ☐ Circuit breaker – skid mounted up to 3000 Amp
- ☐ Circuit breaker auxiliary and trip contacts
- ☐ IBC and OSHPD seismic certification
- ☐ In-skid AVM
- ☐ LV and MV entrance box
- ☐ Manual language – English, French and Spanish
- ☐ Spring isolators
- ☐ 2 year warranty
- ☐ 5 year warranty
- ☐ 10 year major components warranty

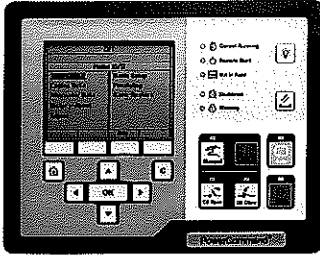
Note: Some options may not be available on all models – consult factory for availability.

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PowerCommand 3.3 Control System



An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

AmpSentry – Includes integral AmpSentry protection, which provides a full range of alternator protection functions that are matched to the alternator provided.

Power management – Control function provides battery monitoring and testing features and smart starting control system.

Advanced control methodology – Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

Communications interface – Control comes standard with PCCNet and Modbus interface.

Regulation compliant – Prototype tested: UL, CSA and CE compliant.

Service – InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

Easily upgradeable – PowerCommand controls are designed with common control interfaces.

Reliable design – The control system is designed for reliable operation in harsh environment.

Multi-language support

Operator panel features

Operator/display functions

- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- LED lamps indicating genset running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

Paralleling control functions

- First Start Sensor System selects first genset to close to bus
- Phase Lock Loop Synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Load govern control for utility paralleling
- Extended Paralleling (baseload/peak shave) Mode
- Digital power transfer control, for use with a breaker pair to provide open transition, closed transition, ramping closed transition, peaking and base load functions,

Alternator data

- Line-to-neutral and line-to-line AC volts
- 3-phase AC current
- Frequency
- kW, kvar, power factor kVA (three phase and total)

Engine data

- DC voltage
- Engine speed
- Lube oil pressure and temperature
- Coolant temperature
- Comprehensive FAE data (where applicable)

Other data

- Genset model data
- Start attempts, starts, running hours, kW hours
- Load profile (operating hours at % load in 5% increments)
- Fault history
- Data logging and fault simulation (requires InPower)

Standard control functions

Digital governing

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 3-phase, 4-wire line-to-line sensing
- Configurable torque matching

AmpSentry AC protection

- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse var shutdown
- Field overload shutdown

Engine protection

- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown
- Full authority electronic engine protection

Control functions

- Time delay start and cool down
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop
- Data logging
- Cycle cranking
- Load shed
- Configurable inputs and outputs (4)
- Remote emergency stop

Options

- Auxiliary output relays (2)

Emergency standby power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-time running power (LTP):

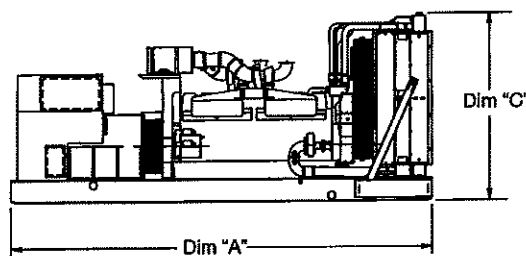
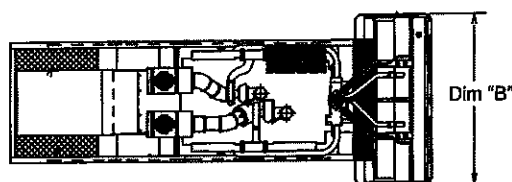
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base load (continuous) power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.



This outline drawing is for reference only. See respective model data sheet for specific model outline drawing number.





Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set Weight* dry kg (lbs)	Set Weight* wet kg (lbs)
DQKAD	6759 (266.1)	2479 (97.6)	3096 (121.9)	16182 (35675)	16882 (37218)
DQKAE	6759 (266.1)	2479 (97.6)	3096 (121.9)	16466 (36301)	17166 (37844)
DQKAF	6759 (266.1)	2479 (97.6)	3096 (121.9)	17837 (39323)	18537 (40867)

* Weights represent a set with standard features. See outline drawings for weights of other configurations.

Codes and standards

Codes may not be available with all model configurations – consult factory for availability.

	This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.		The generator set is available listed to UL 2200, Stationary Engine Generator Assemblies, for all 60 Hz low voltage models. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage. Circuit breaker assemblies are UL 489 Listed for 100% continuous operation and also UL 869A Listed Service Equipment.
	The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.		
	All low and medium voltage models are CSA certified to product class 4215-01.	U.S. EPA	Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards, 40 CFR 60 subpart IIII Tier 2 exhaust emission levels. U.S. applications must be applied per this EPA regulation.

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

North America
1400 73rd Avenue N.E.
Minneapolis, MN 55432
USA

Phone 763 574 5000
Fax 763 574 5298

Our energy working for you.™

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S-1627d (1/13)



cumminspower.com



**Power
Generation**

Exhaust Emission Data Sheet

2000DQKAE

60 Hz Diesel Generator Set

EPA NSPS Stationary Emergency

Engine Information:

Model:	Cummins Inc QSK60-G6 NR2	Bore:	6.25 in. (159 mm)
Type:	4 Cycle, 60°V, 16 Cylinder Diesel	Stroke:	7.48 in. (189 mm)
Aspiration:	Turbocharged and Low Temperature Aftercooled (2 Pump/2 Loop)	Displacement:	3673 cu. In. (60.1 liters)
Compression Ratio:	14.5:1		
Emission Control Device:	Turbocharged with Low Temperature Aftercooled		

	<u>1/4</u>	<u>1/2</u>	<u>3/4</u>	<u>Full</u>	<u>Full</u>	<u>Full</u>
PERFORMANCE DATA	Standby	Standby	Standby	Standby	Prime	Continuous
BHP @ 1800 RPM (60 Hz)	730.5	1461.0	2191.5	2922.0	2647.0	2332.0
Fuel Consumption (gal/Hr)	46.5	82.0	107.4	141.4	124.1	111.6
Exhaust Gas Flow (CFM)	6680	10635	12465	15385	13580	12665
Exhaust Gas Temperature (°F)	780	830	845	900	870	850
EXHAUST EMISSION DATA						
HC (Total Unburned Hydrocarbons)	0.22	0.13	0.10	0.11	0.09	0.09
NOx (Oxides of Nitrogen as NO ₂)	2.70	3.10	4.70	5.30	6.00	5.20
CO (carbon Monoxide)	0.57	0.36	0.13	0.18	0.16	0.15
PM (Particular Matter)	0.16	0.14	0.04	0.04	0.02	0.03
SO ₂ (Sulfur Dioxide)	0.14	0.13	0.11	0.11	0.11	0.11
Smoke (Bosch)	0.50	0.60	0.20	0.20	0.10	0.20

All values are Grams per HP-Hour

TEST CONDITIONS

Data is representative of steady-state engine speed (± 25 RPM) at designated genset loads. Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane number.
Fuel Temperature:	99 \pm 9 °F (at fuel pump inlet)
Intake Air Temperature:	77 \pm 9 °F
Barometric Pressure:	29.6 \pm 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H ₂ O/lb dry air
Reference Standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.



2014 EPA Tier 2 Exhaust Emission Compliance Statement 2000DQKAE Stationary Emergency 60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 2 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII when tested per ISO8178 D2.

Engine Manufacturer:	Cummins Inc
EPA Certificate Number:	ECEXL060.AAD-020
Effective Date:	05/20/2013
Date Issued:	05/20/2013
EPA Engine Family (Cummins Emissions Family):	ECEXL060.AAD (D593)

Engine Information:

Model:	QSK60 G6 NR2	Bore:	6.25 in. (159 mm)
Engine Nameplate HP:	2922	Stroke:	7.48 in. (190 mm)
Type:	4 Cycle, 60°V, 16 Cylinder Diesel	Displacement:	3673 cu. in. (60.2 liters)
Aspiration:	Turbocharged and Low Temperature Aftercooled (2P/2L)	Compression Ratio:	14.5:1
Emission Control Device:	Electronic Control		

Diesel Fuel Emission Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr			Grams per kWm-hr		
	<u>NOx + NMHC</u>	<u>CO</u>	<u>PM</u>	<u>NOx + NMHC</u>	<u>CO</u>	<u>PM</u>
Test Results - Diesel Fuel (300-4000 ppm Sulfur)	4.2	0.75	0.10	5.6	1.0	0.14
EPA Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20
Test Results - CARB Diesel Fuel (<15 ppm Sulfur)	3.8	0.75	0.09	5.1	1.0	0.12
CARB Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20

The CARB emission values are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.

Test Methods: EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A for Constant Speed Engines (ref. ISO8178-4, D2)

Diesel Fuel Specifications: Cetane Number: 40-48. Reference: ASTM D975 No. 2-D.

Reference Conditions: Air Inlet Temperature: 25°C (77°F), Fuel Inlet Temperature: 40°C (104°F), Barometric Pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H₂O/lb) of dry air; required for NO_x correction, Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.

Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.



MATERIAL SAFETY DATA SHEET

No. 2 Diesel Fuel

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: No. 2 Diesel Fuel
Synonyms: CARB Diesel TF3; CARB Diesel; CARB Diesel 10%
CARB Diesel Ultra Low Sulfur - Dyed and Undyed
EPA Low Sulfur Diesel Fuel - Dyed and Undyed
EPA Off Road High Sulfur Diesel - Dyed
High Sulfur Diesel Fuel; Low Sulfur Diesel Fuel
No. 2 Diesel Fuel Oil
No. 2 High Sulfur Diesel - Dyed
No. 2 Low Sulfur Diesel - Dyed; No. 2 Low Sulfur Diesel - Undyed
No. 2 Low Sulfur Distillate
No. 2 Ultra Low Sulfur Diesel - Dyed; No. 2 Ultra Low Sulfur Diesel - Undyed
Super Diesel Fuel; Super Diesel Fuel II-LS
Virgin Diesel Fuel; No. 2 Distillate
Super Diesel Fuel; Super Diesel Fuel II-LS
Virgin Diesel Fuel

Intended Use: Fuel
Chemical Family: Petroleum Hydrocarbon

Responsible Party: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information: 800-762-0942
MSDS@conocophillips.com

Customer Service: 800-527-5476
Technical Information: 800-527-5476

Emergency Overview

24 Hour Emergency Telephone Numbers:

Spill, Leak, Fire or Accident Call CHEMTREC:

North America: (800) 424-9300

Others: (703) 527-3887 (collect)

California Poison Control System: (800) 356-3219

Health Hazards/Precautionary Measures: Causes skin irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Use with ventilation adequate to keep exposure below recommended limits, if any. Avoid contact with eyes, skin and clothing. Do not taste or swallow. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable liquid and vapor. Keep away from heat, sparks, flames, static electricity or other sources of ignition.

Appearance: Straw colored to dyed red
Physical Form: Liquid
Odor: Diesel fuel

NFPA 704 Hazard Class:

Health: 1 (Slight)
Flammability: 2 (Moderate)
Instability: 0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	Concentration (wt %)	ACGIH:	OSHA:	NIOSH:	Other:
Diesel Fuel No. 2 68476-34-6	100	100 mg/m ³ TWA-SKIN	NE	NE	---
Naphthalene 91-20-3	<1	10 ppm TWA 52 mg/m ³ TWA 15 ppm STEL 79 mg/m ³ STEL	10 ppm TWA 50 mg/m ³ TWA	250 ppm IDLH	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, burning, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. No harmful effects from skin absorption have been reported.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): Low degree of toxicity by ingestion. ASPIRATION HAZARD - This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs and Symptoms: Effects of overexposure may include irritation of the respiratory tract, irritation of the digestive tract, nausea, diarrhea, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Cancer: There is inadequate information to evaluate the cancer hazard of this material. See Section 11 for information on the individual components, if any.

Target Organs: Inadequate evidence available for this material. See Section 11 for target-organ toxicity information of individual components, if any.

Developmental: Inadequate data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	125-180°F / 52-82°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
OSHA Flammability Class:	Combustible liquid
LEL%:	0.3
UEL%:	10.0
Autoignition Temperature:	500°F / 260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors (see Section 5). Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practices.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact, possible irritation, and skin damage. Examples of approved materials are nitrile or Viton® (see glove manufacturer literature for information on permeability). Depending on conditions of use, apron and/or arm covers may be necessary.

Eye/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse. It is recommended that impervious clothing be worn when skin contact is possible.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Straw colored to dyed red
Physical Form:	Liquid
Odor:	Diesel fuel
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure (mm Hg):	0.40
Vapor Density (air=1):	> 3
Boiling Point:	300-690°F / 149-366°C
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.81-0.88@ 60°F (15.6°C)
Bulk Density:	7.08 lbs/gal
Viscosity cSt @ 40°C:	1.7-4.1
Percent Volatile:	Negligible@ ambient conditions
Evaporation Rate (nBuAc=1):	<1
Flash Point:	125-180°F / 52-82°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL%:	0.3
UEL%:	10.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc.

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides. The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products (e.g., oxides of carbon, sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels. See Section 11 for additional information on hazards of engine exhaust. IARC has classified Diesel exhaust as probably carcinogenic in humans.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Diesel Fuel No. 2 (68476-34-6)

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA.

Target Organs: Limited evidence of renal impairment has been noted from a few older case reports involving excessive exposure to diesel fuel No. 2. However, renal toxicity has not been demonstrated to be a consistent finding of diesel fuel exposure.

Naphthalene (91-20-3)

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Acute Data:

Diesel Fuel No. 2 (68476-34-6)

Dermal LD50= >5ml/kg (Rabbit)

LC50= No data available

Oral LD50= 9 ml/kg (Rat)

Naphthalene (91-20-3)

Dermal LD50= >2.5 g/kg (rat)

LC50= >340 mg/m³/1H (rat)

Oral LD50= 490 mg/kg; 2.6 g/kg (rat)

12. ECOLOGICAL INFORMATION

When middle distillate hydrocarbons escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with middle distillates can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of middle distillates are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of middle distillates. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled material. Direct toxicity and fouling of sea birds can occur if birds dive through floating layers of spilled material.

Phytotoxic effects of middle distillate hydrocarbons have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in middle distillates.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not a RCRA "listed" hazardous waste. However, it should be fully characterized for ignitability (D001) and benzene (D018) prior to disposal (40 CFR 261). Use which results in chemical or physical change or contamination may subject it to regulation as a hazardous waste. Along with properly characterizing all waste materials, consult state and local regulations regarding the proper disposal of this material.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT

Shipping Description: Diesel Fuel, Combustible liquid, NA1993, III

Non-Bulk Package Marking: Not regulated in non-bulk quantities

Non-Bulk Package Labeling: Not regulated in non-bulk quantities

Bulk Package/Placard Marking: Combustible/1993

Packaging - References (Exceptions, Non-Bulk, Bulk): 49 CFR 173.150(f), 173.203, 173.241

Hazardous Substance: None

Emergency Response Guide: 128

Note: This product has been reclassified as a Combustible Liquid for domestic land transportation using 49 CFR 173.150(f).

IMDG

Shipping Description: UN1202, Diesel fuel, 3, III (52°C)

Non-Bulk Package Marking: Diesel fuel, UN1202

14. TRANSPORT INFORMATION

Labels: Flammable
Placards/Marking (Bulk): Flammable/1202
Packaging - Non-Bulk: P001, LP01
EMS: F-E, S-E

ICAO/IATA

UN/ID #: UN1202
Proper Shipping Name: Diesel fuel
Hazard Class/Division: 3
Packing Group: III
Subsidiary risk: None
Non-Bulk Package Marking: Diesel fuel, UN1202
Labels: Flammable

	LTD. QTY.	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)

Acute Health: Yes
Chronic Health: No
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Naphthalene.....91-20-3.....<1%

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:
-- None Known --

California Proposition 65:

Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Benzene -- Cancer, Developmental and Reproductive Toxicant
Naphthalene -- Cancer
Toluene -- Developmental Toxicant

Diesel engine exhaust, while not a component of this material, is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

Carcinogen Identification:

This material has not been identified as a carcinogen by NTP, IARC, or OSHA. See Section 11 for carcinogenicity information of individual components, if any.

Diesel exhaust is a probable cancer hazard based on tests in laboratory animals. It has been identified as a carcinogen by IARC.

TSCA:

All components are listed on the TSCA inventory.

International Regulations:

Canadian Regulations:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Domestic Substances List: Listed

WHMIS Hazard Class:

B2 - Flammable Liquids

D2B - Materials Causing Other Toxic Effects - Toxic Material

16. OTHER INFORMATION

Issue Date:	21-Feb-2006
Previous Issue Date:	13-Feb-2003
Product Code:	Multiple
Previous Product Code:	Multiple
Revised Sections or Basis for Revision:	Product Name / Synonyms (Section 1)
MSDS Code:	001847

Disclaimer of Expressed and implied Warranties:

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